

University of Groningen

## Ukraine's unfinished natural gas and electricity reforms

Bayramov, Agha; Marusyk, Yaroslava

*Published in:*  
Eurasian Geography and Economics

*DOI:*  
[10.1080/15387216.2019.1593210](https://doi.org/10.1080/15387216.2019.1593210)

**IMPORTANT NOTE:** You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2019

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Bayramov, A., & Marusyk, Y. (2019). Ukraine's unfinished natural gas and electricity reforms: one step forward, two steps back. *Eurasian Geography and Economics*, 60(1), 73-96.  
<https://doi.org/10.1080/15387216.2019.1593210>

**Copyright**

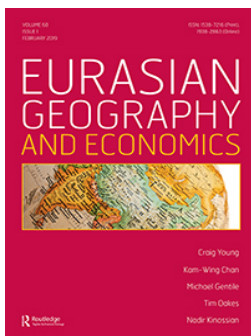
Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

**Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

*Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.*



## Ukraine's unfinished natural gas and electricity reforms: one step forward, two steps back

Agha Bayramov & Yaroslava Marusyk

To cite this article: Agha Bayramov & Yaroslava Marusyk (2019) Ukraine's unfinished natural gas and electricity reforms: one step forward, two steps back, Eurasian Geography and Economics, 60:1, 73-96, DOI: [10.1080/15387216.2019.1593210](https://doi.org/10.1080/15387216.2019.1593210)

To link to this article: <https://doi.org/10.1080/15387216.2019.1593210>



© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 20 Mar 2019.



Submit your article to this journal [↗](#)



Article views: 915



View related articles [↗](#)



View Crossmark data [↗](#)



OPEN ACCESS



# Ukraine's unfinished natural gas and electricity reforms: one step forward, two steps back

Agha Bayramov and Yaroslava Marusyk

Department of International Relations, University of Groningen, Groningen, The Netherlands

## ABSTRACT

This paper seeks to explain Ukraine's natural gas and electricity sector reforms, to outline the challenges facing these two sectors going forwards and to identify prospects for renewables. It makes three core arguments: First, the regulatory templates promoted by the European Union do not lend themselves to swift implementation. This is because the EU's approach has been supply-driven, in the sense that it exports regulatory templates already developed within the EU; it is not, therefore, a suitable problem-solving measure for a crisis-stricken country with limited capacities and powerful vested interests. Second, there has been very slow progress made in innovative and creative shifts in Ukrainian energy transition policy, showing a lack of commitment to the transformation and modernisation of energy systems that should in principle be based on the promotion of new business models backed up by reformed political, regulatory and industrial infrastructures. Third, Ukrainian elites have been formally open to the flow of rules as evidenced by a number of agreements concluded between the EU and Ukraine. But, in practice, the pre-existing, deep-seated preferences of those elites have perpetuated the opaque gas trading system, resulting in them being very selective about the rules that they are actually prepared to adopt.

## ARTICLE HISTORY

Received 12 January 2019

Accepted 7 March 2019

## KEYWORDS

Ukraine; European Union (EU); natural gas; electricity; renewables

## Introduction

Energy is at the heart of every state's economic well-being, and thus its social and political health. A well-functioning energy sector, which enables all other forms of activity, is essential to economic and national security. The weaknesses of Ukraine's energy sector since independence in 1991 shine a spotlight on the foundational link between not only energy security and national security but also domestic politics and systemic corruption. The Ukrainian energy sector is a strategic one prone to all kinds of risk, including fluctuating oil prices, the development of competing pipelines in Europe and the rise of renewable energy

**CONTACT** Agha Bayramov  [a.bayramov@rug.nl](mailto:a.bayramov@rug.nl)  Department of International Relations, University of Groningen, Groningen, The Netherlands

© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.  
This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

sources (RES) (Wageningen University Report, 19 September 2018). While Ukraine's energy sector accounts for about 12.6 per cent of its gross domestic product, the country's energy intensity is staggering (Antonenko, Nitsovych, and Pavlenko 2018). This creates a massive headwind that undermines national welfare, disturbs economic growth and job creation, and leaves the country vulnerable to political pressure from energy suppliers.

Late 2013 brought the so-called Euromaidan protests, which were triggered by President Yanukovych's decision to withdraw from signing the European Union Association Agreement as well as his subsequent downfall and Russia's invasion of Crimea thereafter. Due to this conflict Moscow unilaterally dismissed the 2010 Kharkiv Accords, which had offered a discount price on gas in exchange for its leasing of a naval base in Sevastopol until 2042. Occupation of the Donbas region by Russian-backed militants disrupted the energy structure of Ukraine. The country's economy is still in desperate straits due to the loss of infrastructure, in particular energy infrastructure, and because of the severe recession of the past four years first induced by the war in eastern Ukraine.

In the wake of Russia's invasion and annexation of Crimea, Ukraine launched crucial reforms to improve its energy security while simultaneously decreasing its dependency on and diversify its resources away from its eastern neighbour. Reforming its energy sector is key unfinished business in Ukraine's both economic and political agendas. Although there have been several reform plans in the past, only after Euromaidan were energy security concerns addressed on a qualitatively new level in 2014. Following this, in 2017 Ukraine adopted a new "Energy Strategy of Ukraine" until 2035 and began accepting systematic and comprehensive energy reforms – ones that are also forced on it by international donor organisations like the World Bank and the International Monetary Fund (IMF) (Antonenko, Nitsovych, and Pavlenko 2018; Oxenstierna and Hedenskog 2017). Three simultaneous processes can be said to characterise these energy reforms: pricing reforms; diversifying away from Russian gas supplies; and, working on compliance with the EU energy regulations within the framework of Ukraine's "Association Agreement and Deep and Comprehensive Free Trade Area" (DCFTA) that entered into force on 1 September 2017 (Antonenko, Nitsovych, and Pavlenko 2018).

This paper seeks to explain Ukraine's energy reforms after Euromaidan in 2013–2014. The country has experienced three serious periods of revolution, and each (the others being in the years 1991–92 and 2004, respectively) stimulated structural reforms – none as crucial as the ones following Euromaidan in 2014, however. Therefore, the key question is whether Ukraine has finally moved forwards or not. To answer this, the article discusses natural gas and electricity reforms, outlines the achievements, changes and challenges facing the sectors, and explores the opportunities for the Ukrainian natural gas and electricity sectors in future. The reasons for

choosing these two sectors are that, first, the energy sector is broad and it is beyond the scope of this paper to cover all its parts (e.g. nuclear, coal, oil, natural gas, renewables etc.). Second, the Ukrainian gas and electricity sectors – both of which are the key subjects of the Energy Community (EC) Treaty – are based on outdated Soviet-era infrastructure and anachronistic law and business practices. The country is one of the biggest consumers of natural gas in Europe and an important gas transit player – most of Russia's natural gas exports to the EU are transported through the Ukrainian gas transportation system. Ukraine is also one of the biggest producers of electricity in Europe.

This article makes three core arguments: First, the regulatory templates promoted by the European Union do not lend themselves to swift and easy implementation. This is because the EU's approach has been supply-driven, in the sense that it exports regulatory templates already developed within the EU; it is not, therefore, a suitable problem-solving measure for a crisis-stricken country with limited capacities and resources on the one hand and powerful vested interests on the other. Second, there has been very slow progress made in innovative and creative shifts in Ukrainian energy transition policy, showing a lack of commitment to the transformation and modernisation of energy systems that should in principle be based on the promotion of new business models backed up by reformed political, regulatory and industrial infrastructures. Third and finally, Ukrainian elites have been formally open to the flow of rules as evidenced by a number of agreements concluded between the EU and Ukraine. But, in practice, the pre-existing, deep-seated preferences of those elites have perpetuated the opaque gas trading system, resulting in them being very selective about the rules that they are actually prepared to adopt. This does not imply that reform is impossible, only that it is necessary to be more cautious regarding internal challenges and not to expect unrealistic, short-term results immediately.

The paper is divided into four parts. Following the introduction, the second section critically discusses natural gas reforms. The third section then explains electricity reforms and prospects for renewables. The conclusion presents the paper's findings and identifies also its limitations.

## **Natural gas reforms and Ukraine's integration into the European energy market**

In 2006 a dispute with Russia over the terms of gas supply and pricing led to cut-offs and reductions in delivery. Following this crisis, Ukraine launched weak energy reforms such as increasing domestic gas tariffs and delinking transit ones and the gas price (Pirani 2017). However, these were not actually implemented and as a result the problems were never genuinely addressed; this led to a second dispute in 2009. Moscow asserted that Ukraine had failed to adhere

to provisions of gas supply and transit contracts. In response, Ukrainian officials denied these claims and began again to strengthen Kyiv's position on gas matters vis-à-vis Russia (Radio Free Europe, 3 January 2009).

For example, in 2011 Ukraine became a member of the Energy Community (EC), the group of East and Southeast European countries that have voluntarily agreed to adopt the EU's internal energy market legislation (Antonenko, Nitsovykh, and Pavlenko 2018). In 2014, Ukraine then started to negotiate with a number of European countries – namely Hungary, Poland and Slovakia – and their energy companies on enabling reverse flows of gas (Higgins 2014). Nevertheless, neither of these twin efforts came rapidly to fruition. First, Ukraine did little to decrease its gas dependence on Russia and did not reform the energy sector to reduce the latter's leverage over its westerly neighbour. EC membership required both legislative work to implement the entire *acquis communautaire* – the body of laws governing network energy systems in the EU – and institutional changes such as the unbundling of different functions within the electric power and gas industries. Second, the reverse-flow arrangements initially faced several technical and commercial difficulties, some caused by Russia as it sought to avoid a loss of market share or to exercise its leverage over Ukraine (Antonenko, Nitsovykh, and Pavlenko 2018).

Natural gas is one of the core parts of Ukraine's energy mix, one that is commercially utilised across both the domestic and industrial sectors. According to Naftogaz Europe, in 2018 Ukraine's gas consumption remained relatively stable – increasing by 0.4 billion cubic metres (1.3 per cent) to 32.3 bcm as compared to 31.9 bcm consumed in 2017 (Naftogaz, 1 January 2019). Gas plays a particularly prominent role in heat generation such as for the domestic, public and industrial sectors. In the absence of a transparent and well-regulated gas market, Ukraine's gas supply and transit relationship with Russia is widely understood to have enriched corrupt politicians and oligarchs in both countries (Goncharuka and Stortob 2016). In this sense, decision-making in Ukraine's gas industry previously took the form of a series of tactical course corrections – tailored to short-term political expediency rather than any long-term strategy, and not executed according to established international practices within the industry (Antonenko, Nitsovykh, and Pavlenko 2018).

In the wake of the Russian invasion, Ukraine domestic consumption dropped dramatically – from 50.4 bcm in 2013 to 32.3 bcm in 2018 (Naftogaz, 1 January 2019). However, this reduced demand stemmed predominantly from an overall economic crisis as well as from the fact that many energy-intensive industrial facilities are located in the two eastern regions now controlled by Russian-backed militants. A further reason is the rapid price increases for domestic consumers and the removal of subsidies for some categories of them. Between 2014 and 2016, household gas prices doubled; this increase continued in the 2017 and 2018 winter seasons in order to comply with international requirements

(Eurostat 2018). On 25 March 2015, the Cabinet of Ministers of Ukraine adopted the “Gas Sector Reform Plan” to decrease the country’s natural gas dependency on Russia, to increase its energy efficiency and to meet the EU’s natural gas standards (Radchenko 2015). According to the EC (2017), the plan is one of the preconditions for further EU, European Bank for Reconstruction and Development (EBRD), European Investment Bank, IMF and World Bank assistance to Ukraine. The three most important aims of the gas market reform being undertaken by the Ukrainian government are:

- the creation of a competitive market underpinned by a legal and regulatory framework compatible with the EU’s own one;
- the break-up of Naftogaz Ukraine, in accordance with that framework;
- and, the abolition of price regulation as well as, in the case of domestic customers, its replacement by a system of direct subsidies.

### ***New legal and regulatory frameworks***

One of the energy reforms of Ukraine is to simplify the legal and regulatory requirements for the electricity and natural gas sectors. For example the Ukrainian government adopted a new Gas Market Law on 9 April 2015, which entered into force on 1 October 2015 (Legislation of Ukraine, 1 October 2015). It is one of the most important reform measures adopted by the new government, and a key precondition of IMF financial assistance to Ukraine. It was drafted in cooperation with the Secretariat of the EC.

The law provides for full alignment with the EU’s Third Energy Package (3EP),<sup>1</sup> and creates the basis for a competitive gas market in Ukraine. The new law deprives Naftogaz of its monopoly status, and enforces a break-up of the company (Wolczuk 2016). Most notably, it strikes at the interests of one of the most powerful oligarchs in Ukraine, Dmytro Firtash, who controls 80 per cent of the country’s regional gas distribution companies (Wolczuk 2015). However, the actual implementation of this law is still in question as it exists still only on paper. Its implementation depends on an independent and transparent judiciary system. As argued by Malygina (2010), the Ukrainian judiciary is not as independent as it should be; the country’s courts have become part of political machinations and often pass politically motivated sentences, and therefore are a pawn in elites’ power struggles.

Traditionally, gas prices for both Ukrainian households and municipal heating utilities have always been heavily regulated and subsidised (Sendich 2014; Rozwałka and Tordengren 2016). Because of these huge energy subsidies, Ukraine had the lowest household prices for gas and electricity in Europe; they were only one-eighth of world market prices (Eurostat 2018). The explanation for this policy was that a few politically powerful gas traders bought

large volumes of subsidised gas at a low price and resold it at a higher one to industrial customers and exported it far abroad, making a few billion United States dollars each year (Aslund 2016).

Due to Western pressure, Ukraine eventually had to stop this policy however. More concretely, an adjustment of highly subsidised gas prices for domestic use to market levels is a key precondition for IMF loans (Oxenstierna and Hedenskog 2017). Without that organisation's tranches, the Ukrainian government would be unable to cover "the budget deficit, timely payments of pensions, payment of external debt and salaries, financing of the army and security sector" (Ekonomiczna Pravda, 12 November 2018). In 2014, the average household price was approximately USD 24 per thousand cubic metres while the one charged to industry consumers was around USD 242 tcm (Naftogaz 2014). Later the gas price for most domestic customers rose to roughly USD 276 per tcm, while district heating tariffs increased by an average of 110 per cent. As of January 2018, the monthly utilities bill for an 85-square-metre apartment in Kyiv is estimated at around USD 90, or about one-third of the average monthly salary (Pirani 2017). In addition, the Ukrainian parliament adopted legislation requiring all utilities to install heat and hot water metres – which is anticipated to further drive improvements in efficiency.

In place of artificially low gas prices, the government has instituted a programme of more targeted direct payments to cover the costs of gas and gas-fuelled heating. This programme does not employ direct cash transfers to households that lack the ability to pay, the structure that is often found in similar such programmes around the globe. Instead, the Ukrainian government uses the consumer's official income and utility expenses to decide on the discounted final bill and to reimburse the company providing utility services (Antonenko, Nitsovych, and Pavlenko 2018). However it is argued that this safety net programme is far too broad, considering IMF estimates that as many as half of all households receive assistance (Antonenko, Nitsovych, and Pavlenko 2018). Thus, further work is required to improve the programme's efficiency and effectiveness.

Meanwhile, Ukraine has accepted a law to facilitate energy competition at the industrial level but still lacks such competition on the consumer one – because it has fixed the energy price for households. The main problem with this household price is that it is still controlled and determined by politicians rather than by, ideally, the market economy. The Ukrainian government should accept regulatory laws and legal instruments to facilitate market prices, but politicians should not be responsible for x or y gas price (Chow 2016). Additionally, it can be seen that Ukraine is undertaking energy reforms because of constant international pressure to do so. This means that when the leveraging of the IMF, the EU and the World Bank stops, Ukraine might terminate its reforms.



Prange-Gstöhl (2009) highlights that non-EU member countries tend to accept external requirements due to reasons of identification, independence and economics. In the case of Ukraine, Wolczuk (2004) argues that its self-identity and statehood are seen as European rather than Eurasian – so as to make clear the difference between itself and Russia. Independence, meanwhile, means that Ukraine accepts EU rules because it expects the latter to exert pressure on Russia should that country uses oil and gas as a form of leveraging (Padgett 2011). Regarding economics, Ukraine aims – with the liberalisation of its internal market – to access the EU's own internal markets and to attract its member states' investments in its own one. According to Oxenstierna and Hedenskog, "macro-financial assistance loans amounting to €3.4 billion have been committed since 2014, of which €2.2 billion have been disbursed" (2017, 41).

A third instrument, a new law that implements an EU directive on the efficiency of buildings, was adopted in June 2017, while a long-awaited Energy Efficiency Fund was set up in September 2017 (Legislation of Ukraine, 22 June 2017). The need for energy-efficiency improvements across the Ukrainian economy is enormous. In 2016, the Ukrainian government spent roughly 70 times more on subsidies for public utilities than it did on energy efficiency. Over the next 15 years, Ukraine is projected to undertake modernisation programmes for buildings owned by national or local governments that will cost approximately USD 65 billion; only a tiny portion of that amount was budgeted in 2017, however. This clearly means that in the absence of new investment, the government will continue to spend more on energy than on efficiency improvements.

Finally, the Amendments to Some Legislative Acts of Ukraine on Simplification of Some Aspects of the Oil and Gas Industry was passed on 1 March 2018 (Verkhovna Rada of Ukraine, 1 March 2018). The law provides for the simplification of certain regulatory procedures, and is aimed at decreasing corruption in the course of granting licences for subsoil use and providing more legal protection to investors (Dumych, Zheka, and Kravtsova 2018). In particular, the law provides for the cancellation of numerous permits for the holders of oil and gas licences – inter alia, mining allotments, permission for certain constructions and approvals for the transfer of a company's geological information to third parties. The field of land use is also covered. In particular the law allows the servitude mechanism for the construction of oil and gas mining, and pipeline transportation objects to be used without changing land zoning (Dumych, Zheka, and Kravtsova 2018). These rules are common all over the world, but it is the transparent application of them that is missing in Ukraine.

On paper these laws look decent and positive, but the main question is whether the new Ukrainian government has the capacity and political will to actually implement them. Puglisi (2003) explains that there is a systematic relationship between the political and economic elites in Ukraine, because

these two domains never became clearly separated there. As a result, oligarchs systematically pushed through reforms that would help to preserve their status while obstructing policies that would endanger their interests. Similarly, Wilson (2013) explains that it is easy for them to push because oligarchic groups have captured the legislative, executive and judicial apparatus. As mentioned above, these laws are also accepted because of international pressure and as a result of them being conditions for further support. They have not been initiated by Ukraine on its own.

As such it is argued that due to political and economic obstacles and resistance from oligarchs, the implementation of these laws usually faces decades-long, insurmountable challenges (Aslund 2005; Kuzio 2012). According to the literature, the reason for this is that the Ukrainian oligarchs or elites selectively support these new laws (Aliyev 2016; Grødeland 2010; Malygina 2010; Puglisi 2003). In other words, they back those that work for them and resist the laws that make the further accumulation of wealth difficult. Malygina (2010) argues that by using informal practices, Ukrainian oligarchs prefer to apply the “rule by law” rather than the “rule of law”. More concretely, she explains that in Ukraine courts are privatised and instrumentalised to meet the interests of different actors and thus the law becomes a commodity that can be purchased. For example, despite the fact that the necessary programmes and plans have already been prepared and approved, they have not been fully executed, which has resulted in few effective changes in the country’s energy sector. This is what happened with the 2006 and 2013 energy strategies too. Neither was fully implemented, mostly because unrealistic goals and objectives were specified without consideration for existing economic conditions and strong oligarch resistance (Chumak and Prokip 2018).

However, one of the key questions to be asked is what, if anything, makes this time around different. In answering this, it is necessary to consider both the internal and external dimensions. Externally, Russia is under US and European sanctions, which ultimately means that Ukrainian elites need to decide whether they want to follow Russia or Europe. This was not the case in the past. Related to this, Western countries are also now demonstrating systematic levels of support (political, economic and technical) and leveraging for Ukraine’s reform efforts – also different from the past (Oxenstierna and Hedenskog 2017). Internally, meanwhile, Ukraine has a much stronger sense of an independent identity because in 2014 it lost 10 per cent of its territory after the Russian invasion – unlike in 2004, 2006 and 2009. Additionally, Ukrainian civil society and volunteer movements were stronger in the pre-war years – albeit imperfectly so.

However, similar to 2005 reforms, internally Ukraine is still struggling with rich oligarchs, Soviet mindset business practices and corruption. Another similar point is that there is still a lack of political unity and poor cooperation between the Verkhovna Rada (Ukraine’s parliament) and the Cabinet of

Ministers (executive branch of government). According to Puglisi (2003), parliament is one of the main channels via which business elites can defend their positions, lobby for state subsidies, obstruct reforms and acquire personal immunity from prosecution in Ukraine. In the same vein, several scholars highlight that this situation has never gone away and that oligarchs controlled parliament during the Kuchma, Yushchenko and Yanukovych regimes (Aliyev 2016; Malygina 2010; D'Anieri 2007; Pleines 2009). By discussing the recent parliament reforms, Aliyev (2016) highlights that not all members of parliament have extra-legal incomes, such as their own businesses, and that their official salary remains at around USD 300 per month – thus it is unrealistic to expect informal deals between MPs and business elites to disappear. Additionally the implementation of these laws might be disrupted by the protracted political season preceding the 2019 presidential and parliamentary elections, in which Ukraine's voters will get their chance to pass verdict on the domestic and foreign policy achievements and failures that have shaken their country since 2014 (Balazs 2018).

### ***Reverse gas flows***

The second energy reform includes reverse gas flows, which aim to decrease Russian gas imports and diversify Ukraine's natural gas supplies. In 2013, gas imports still came only from Russia and accounted for more than half of all consumption (EIA 2017). Gas continued to flow through mid-June 2014, despite the annexation of Crimea and the reciprocal levelling effect of sanctions (Stulberg 2018). The gas cut-off temporarily imposed by Russia in 2014 occurred after negotiations had already begun, but substantive differences were narrowed down without causing arbitrary transit shortfalls to Europe (BBC, 31 October 2014). The trilateral package agreed between Ukraine, the Russian Federation and the European Commission helped the country to purchase sufficient gas supply for the winter of 2015–16, and also to ensure smooth and reliable gas transit through its territory (Stulberg 2018).

With the opening of a reverse flow capacity from Slovakia in September 2014, Ukraine began to gradually diversify the route of its gas supplies (Radio Free Europe, 16 August 2014). In a sign of the changed relationship with Moscow, Ukraine suspended gas purchases from Russia in 2015 (BBC, 30 June 2015; Antonenko et al. 2018). Consumption was reduced, while Naftogaz reached agreements to buy gas from European energy companies. In 2016, Ukraine halted gas imports from Russia altogether.

Relatively large shale gas deposits (924bcm) exist in Ukraine, but they are not of key relevance in the short to medium term as the necessary funding and technology to exploit them are currently absent. Moreover, Kyiv is now aiming to expand primarily conventional gas production from the current level of around 20 bcm to 27.6 bcm by 2020 (Antonenko, Nitsovych, and Pavlenko

2018). This expansion seems difficult to realise however, because the Ukrainian government started the new tender process very late and furthermore it is not transparent. As such, expanding conventional gas production will only be possible if further anti-corruption reforms are implemented establishing international standards, a transparent bidding system and making the relevant data available to everyone – which, in turn, would increase foreign investment in the country.

It seems likely that Ukraine's demand will be met principally from its own natural resources, as well as by reverse-flow deliveries from Central European markets. With the current low levels of demand for gas, the country has been able to do so entirely from reverse-flow deliveries. Ending direct Russian imports has been made a strategic priority by the government and by Naftogaz, and it is argued that achieving this seems entirely possible (Stulberg 2018). For example, total capacity for reverse-flow deliveries – as reported by Naftogaz after the expansion of the interconnection capacity with Slovakia – is 22 bcm. It is argued that what post-Soviet Ukraine had not achieved after 20 years of existence became possible within only 18 months. Given the considerable potential for energy savings and reverse flows of Russian gas from the EU, Ukraine's overwhelming dependence on energy sourced from its eastern neighbour has declined dramatically (Stulberg 2018).

The commencement of reverse-flow deliveries of gas to Ukraine via Hungary, Poland and Slovakia in 2014 initiated a measure of competition between these volumes, priced in relation to the European market. In 2016, Ukraine imported 11.1 bcm of gas from the EU: from Slovakia 9.1bcm, Hungary 1 bcm and Poland 1 bcm. In the third quarter, in particular, the prices of reverse-flow deliveries (as reported by the Ministry of Economy, based on customs data covering both Naftogaz and non-Naftogaz imports) were significantly higher than the ones Gazprom offered for that. While this costs Ukraine extra money, it also undermines Gazprom's energy leverage. One sign of progress in energy market reform is the entry into the Ukrainian one of three traders already operating in the European market: Engie, Trailstone and DufEnergy (Engie, 28 October 2018). All three have prominently participated in exporting reverse-flow gas to Ukraine since 2014, while in October 2016 they signed agreements about transporting and storing gas in the country; Engie began to do this in small volumes from January 2017.

When evaluating Ukrainian energy reforms, it may be helpful to think of two key points. The first is related to the Russia–Ukraine gas trade: efforts are made by the latter to minimise its dependence on gas imports from the former while simultaneously seeking to maximise dependency on European reverse gas flows. While Ukraine has indeed decreased direct gas flows from Russia the question still remains: What is the original source of this reverse gas? Is it really European, or is it rather the Russian gas that European companies buy and then sell again to Ukraine? It is more likely the second.

However, Moscow might not be able to use energy supplies as leverage against Kiev to the same degree that it used to previously (Bayramov 2018; Grigas 2017). More specifically, Russia will struggle to pressure Ukraine since the latter can simply purchase Gazprom's gas from the company's European customers under EU energy market regulations – which protect the rights of energy consumers and prevents energy monopolisation. A key advantage of the reverse flows from interconnectors with Slovakia and others is that it is priced competitively under EU market regulations, whereas the gas imported via the country's eastern border comes on long-term and take-or-pay contracts with oil indexation (Padgett 2011). Therefore, Ukraine aims to be insured under this liberalised and regulated EU gas market as it strives to make leveraged Russian energy a blunt tool. While this energy strategy might bring Ukraine under EU protection, it will not fully secure the country's natural gas flows. Rather, it changes the supplier from A to B and thus this time around the country is becoming more dependent on European companies instead – which goes against the new energy package's underlying goals.<sup>2</sup>

Second, it is not only Ukraine but also indeed Russia that seeks to diversify gas transit away from the former (Pirani 2017). The volume of Russian gas being transported across Ukraine has been in long-term decline, from 128.5 bcm in 2006 to 67.1 bcm in 2015 – though recovering by 22 per cent, to 82.2 bcm, in 2016 (Pirani 2017, 2018). Although this figure then increased to 93.5 bcm in 2017, it fell by 7 per cent to 86.6 bcm in 2018 (Reuters, 2 January 2019). The main reason for higher transit volumes in 2016 was the increased quantity of Russian exports to Europe, made possible by Gazprom's more flexible pricing policies, high European import demand and the lack of competition from liquefied natural gas (LNG). The utilisation of Nord Stream's pipeline has been rising steadily, with total volumes transported via it rising from 23.8 bcm in 2013 to a record of 58.8 bcm in 2018 due to the completion of a second one (Nord-Stream press release 2019). The European Commission (EC) regulatory decision approving Gazprom's access to 80 per cent of the OPAL pipeline's transport potential, taken in October 2016, might allow the Russian state enterprise to use close to the full capacity of Nord Stream (55 bcm) during high seasonal demand, reducing transit via Ukraine by a further 10 bcm.

Overall, it can be argued that the rapid implementation of gas market reforms is unlikely. The 2015 law is just the first of a series of long and challenging reform measures. The regulatory templates promoted by the EU do not, as noted, lend themselves to swift and easy implementation. This is because the EU's approach neglects the fact that informal rules matter in Ukraine. Malygina (2010) explains that the formal framework only limits the scope of action, but actors are not guided in their behaviour by these formal rules. Thus while Ukrainian politicians, on the surface at least, try to adhere to the former logics, they are guided in their actions both by formal and informal logics. Abbott and Wallace (2009) emphasise that this is a common practice in

the former Soviet countries but it can take multiple forms, have varying effects and include different interest groups.

In this sense, the EU needs to understand these differences when supporting the post-Soviet countries. Its templates have been supply-driven, in the sense that it exports regulatory templates already developed within the EU; it is not, therefore, a suitable problem-solving measure for a crisis-stricken country with limited capacities and resources on the one hand and powerful vested interests on the other. As Magen notes, 'the complex, detailed and dynamic nature of the regulatory framework raises both substantive and procedural difficulties for any third country intended on full or partial alignment with the *acquis*' (2007, 366).

Restructuring the energy sector is a particularly demanding process, one requiring an overhaul of the entire regulatory framework, de-monopolisation as well as fundamental reorganisation of how accompanying infrastructure is even managed. It is important to note that some oligarchs are now actively involved in the promotion of Ukraine's economic integration into the EU because that would help facilitate access to Western markets and, at the same time, increase the level of protection of property rights in the country – thus securing the oligarchs' own positions (Malygina 2010). In this sense, Pleines (2009) highlights that Ukrainian oligarchs seek only economic and not political integration with the EU. Reforming the energy sector will be a long-term challenge, and thus it remains to be seen whether Ukraine will be the first country in the "common neighbourhood" to break the vicious circle of energy dependence, inefficiency and corruption (Wolczuk 2016). In so doing, Ukraine should not replicate Georgia's mistake – with that country eliminating Russian energy dependency but coming to rely on Azerbaijan instead (Bayramov and Nolan 2017).

### ***Reforming Naftogaz***

The final consideration regarding energy reforms is the desperate need for Naftogaz itself to be restructured, that for greater transparency, efficiency and responsiveness in light of changing market circumstances (OECD Report 2018). Naftogaz and its subsidiaries: build, operate and maintain transit oil and gas pipelines; distribute gas; operate gas storage facilities; explore for and produce oil and gas across Ukraine; and, provide numerous ancillary services too. Naftogaz is the single-largest contributor to the state budget of USD 3.9 billion, accounting for about 15 per cent of the 2017 one (Naftogas Annual Report 2017). There are two core reasons why Naftogaz still needs to be reformed: first, restructuring the company is a requirement under the EC and Ukraine's Association Agreement with the EU, and, second, it is also a condition built into the country's programmes with international financial

institutions including the IMF, the World Bank and the EBRD (Dumych, Zheka, and Kravtsova 2018).

Ever since Ukraine became a member of the EC in 2011, it has been clear that the state would need to restructure Naftogaz; actual progress has stalled, however, due to entrenched corrupt practices. Momentum has only gathered in the past two years, after earlier failed attempts at restructuring. In 2016, the Ministry of Energy and Coal Mining submitted an unbundling plan to the EC following an independent audit (OECD Report 2018). The 3EP stipulates transmission unbundling and recognises three main models for the energy sector: ownership unbundling (OU), independent system operator (ISO) and independent transmission operator (ITO).

Comparison with nearby EU countries has shown that a mixture of models have been adopted. Many of the operators in the larger and more mature EU markets have implemented the OU model, which is more compatible with efficient and effective market competition – a direction in which Ukraine is seeking to go. The unbundling of Naftogaz is an important issue because the future contract between it and Gazprom should ideally be covered by a new, fully certified transmission system operator (TSO). Additionally, unbundling is crucial to attract investment from reliable EU companies and banks so as to help modernise the Ukrainian transit gas system (World Bank 2016). According to a recent OECD Report (2018), while Neftogaz has accepted unbundling on paper it has not actually given the required authorisation for that to its newly established supervisory board.

Naftogaz has put in place a detailed corporate governance action plan, with the stated goal of creating greater transparency and increasing the predictability of company decision-making. However, these steps forwards were accompanied by delays and obstacles because the Cabinet and Naftogaz management have been actively fighting each other (*Financial Times*, 21 September 2017). In April 2016 the first iteration of the aforementioned independent supervisory board was appointed, but a year after – in September 2017 – all of its independent members, and even one of the government representatives sitting on it, resigned citing “political meddling in Naftogaz’s work” (Antonenko, Nitsovykh, and Pavlenko 2018). A replacement supervisory board was appointed in November 2017. Many analysts argue that securing a long-term role for Ukraine in the European energy security matrix will require effective unbundling of Naftogaz, improvement in regulatory processes, the establishment of a professional and impartial TSO on the basis of EU law, as well as further investment in the modernisation of the system – perhaps from Western companies (e.g. Antonenko, Nitsovykh, and Pavlenko 2018; Dumych, Zheka, and Kravtsova 2018; Haring 2017; Pirani 2017).

However, while reforming Naftogaz, the IMF and the state enterprise’s management staff have faced a number of obstacles – while certain crucial factors have been left unaddressed (European Commission 2016; OECD Report



2018). First, corruption is still an everyday reality in Ukraine's regional distributional companies. Second, the status of Naftogaz subsidiaries remains unclear and the supervisory board has never been granted the power to approve the core strategy as well as the financial and investment plans of the company. Third, work on the separation out of its transport division, Ukrtransgaz, has been postponed until the completion of arbitration proceedings in Stockholm.<sup>3</sup> Fourth, the process has been disrupted by political and parliamentary opposition to it. Fifth, attempts to find investors in Ukraine's transmission system have made little headway due to the uncertainties surrounding the future of the gas transit business, as mentioned above. Sixth and finally, the abolition of price regulation – and in particular the liberalisation of those for domestic customers – may prove the most difficult part of the reform to complete (Pirani 2017).

### Reforms in the electricity sector

Compared to its gas sector, Ukraine's electricity one has received scant academic attention despite its importance to the country's economy and security. While natural gas fuels the majority of the supply of district heating systems, electricity powers the compressors, light, power and pumps that move heated water around the distribution networks to reach consumers. Most of the power-generation resources in Ukraine will reach the end of their life cycle within the next decade, and will need to be replaced or upgraded. The reason for this is that almost all of Ukraine's power plants date back to Soviet times, and around half of them are over 40 years old. Being the eighth-largest producer globally, more than 50 per cent of Ukraine's electricity is generated from nuclear power – with an additional 30 per cent from coal and less than 3 per cent from RES (Antonenko, Nitsovykh, and Pavlenko 2018).

Ukraine has committed to reforming its electricity sector in several ways: through the Association Agreement, the EC Treaty and the Memorandum of Understanding on a Strategic Energy Partnership (European Parliament, July 2017). More concretely, Ukraine's power sector must meet EU environmental standards as a requirement under the EU Association Agreement (Antonenko, Nitsovykh, and Pavlenko 2018; Dumych, Zheka, and Kravtsova 2018). Ukraine remains one of the largest electricity consumers in Europe, even after the economic contraction caused largely by the conflict in the country's east (Eurostat 2017). Total installed capacity amounts to 55.3 gigawatts, of which approximately 3.2 GW – mostly obtained from power plants burning anthracite coal – have been affected by the conflict in eastern Ukraine. The country's electricity sector is dominated by three companies: namely, Ukrenergo, Energoatom and Ukrhydroenergo (OECD Report 2018).

To improve its electricity sector, the new Ukrainian government has initiated a number of reforms. The first key objective is to create a competitive



wholesale and retail electricity market to the benefit of citizens of Ukraine, ensuring that the sector is open to new entrants, transparent in terms of its management and offers a genuine choice to consumers. This agenda is vast and very ambitious, considering Ukraine's starting point. In this sense, on 22 September 2016, a Law on Energy and Utilities Regulator was adopted and a draft Electricity Market Law passed its first reading in parliament (Verkhovna Rada of Ukraine, 3 February 2016). Another major breakthrough was the adoption of the new Electricity Market Law in April 2017, based on the 3EP (Verkhovna Rada of Ukraine, 21 February 2017). The law introduces principles of fair competition and non-discriminatory participation in the electricity market, equal rights to sell and buy electricity, free choice for consumers to select their power suppliers, third-party access to transmission and distribution grids, and price- and tariff-setting that reflect actual costs (Radchenko et al. 2018). The law is designed to divide the current "single-buyer" model into six new markets: (1) the market of bilateral contracts; (2) the day-ahead market; (3) the intraday market; (4) the balancing market; (5) the market for ancillary services; and, (6) the retail market (Radchenko et al. 2018). The National Energy and Utilities Regulatory Commission has drafted the rules for the functioning of the new market and has held public consultations on a number of other important secondary legislation drafts too (rules for transmission and distribution system operators).

The reform of the electricity market touches on the nuclear and coal sectors, since they are Ukraine's main means of electricity generation (Dumych, Zheka, and Kravtsova 2018). This means that the country needs to be comprehensive in its approach to the market and infrastructure, as well as to the impact of both sectors on the national electricity market. The objective of Ukraine here is to decarbonise its economy, as stated in its Energy Strategy 2035 (Logatskiy 2018). This means taking a careful and thoughtful approach to the challenges of the coal sector, including the closure of inefficient or dangerous mines – where the EU can provide assistance, with its experience.

Nonetheless, similar to the natural gas sector reforms, the key challenge that now lies ahead is to actually implement these laws. First, as of the start of 2018, the internal power sector debt was USD 1.04 billion. Meanwhile, the independence of the regulator continues to be a key challenge, without which the electricity market will fail to perform to the benefit of society and the economy – as the regulator is heavily influenced politically, and under oligarchic control. Additionally, the new Electricity Market Law will not take full effect until July 2019. During the transition period, there is a risk that opponents of the new law will either be able to obstruct its implementation or steer it in a manner favourable only to their own narrow interests.

As argued by Puglisi (2003), in Ukraine economic liberalisation has been pushed only as far as allowing the privatisation of state assets – but not the correction of market distortions. In the same vein Klimina (2015) highlights

that, due to their political, economic and media power, a few extremely wealthy people obtained state-controlled assets when economic liberalisation reforms first began. Additionally, Ukrenergo's unbundling awaits actual implementation. According to the latest OECD Report (2018), the reorganisation and reform plans of Ukrenergo have not been fully implemented and are currently stalled. Finally, according to a recent IMF Report (2017) the level of corruption is extremely high in Ukraine and its energy sector, which creates barriers to new actors entering the market. As a result, there is still only low-level competition between electricity producers and a lack of cost efficiency.

### ***Renewable energy: new energy hope for Ukraine?***

It is important to highlight that today electricity is produced not only from coal and nuclear power but also from RES such as solar, wind, hydropower and geothermal. For example, electricity from RES already in 2015 saved the EU several billion euros in fossil fuel imports. It is expected that these savings will increase by 2030. More than one million jobs have already been created due to renewable electricity production, in fact. Meanwhile, many EU citizens today are no longer only consumers but now also producers of electricity too (European Commission 2018).

This is the future that might be possible for Ukraine as well, with the necessary political will and determination. Considering Ukrainian reforms and its new energy strategy, it can be argued that RES should be one of the fastest-growing sources of power in the country over the coming years. Ukraine has sought to ensure that, by 2020, the share of RES in overall energy consumption will be 11 per cent. However, considering current developments, this goal seems unlikely to be reached. According to the BP Statistical Review of World Energy (2016), only a comparatively small portion of the country's total energy consumption is currently accounted for by RES (approximately 1 per cent). At the end of 2017, the total installed capacity of the "green" energy sector in Ukraine amounted to almost 1,375 megawatts – with a 1.44 per cent share in electricity generation (Unian, 10 January 2018). Put bluntly, the share of renewable energy in Ukrainian domestic supply is currently unimportant.

In this sense, the development of renewable energy in Ukraine is progressing slowly because it comes with both a lack of domestic financing and of foreign investment. The most significant challenges faced in expanding the renewable energy sector are cost competitiveness and the financing of related technologies and projects. Existing subsidies for traditional energy sources and other market distortions only heighten these obstacles (Wageningen University Report, 21 September 2018).

Only in February 2018 did Ukraine become a member of the International Renewable Energy Agency (IRENA) that would support the country in the transference of knowledge and technology in the process of making an

energy transition. As a result of joining this organisation, Ukrainian companies that work in the sphere of renewables will receive a number of benefits – such as being able to apply to the Abu Dhabi Fund of Development (ADFD) to receive subsidised credits, to use the other financial instruments available for members and being able to cooperate with other member countries. In this sense, the ultimate goal of Ukraine's membership in IRENA should be to increase its share of RES – which would lead to the replacement of imported fossil fuels, and reduce the country's external energy dependence (Ekologiya Pidpryjemstva 2018; Antonenko, Nitsovykh, and Pavlenko 2018). For example, IRENA predicts that Ukraine has the potential to increase its share of renewables by up to 20–25 per cent by 2030 (IRENA2014, 1). The highest potential is in expanding the country's utilisation of biomass because of the abundance of fertile black soil there, further to extensive agricultural and forestry waste too.

Nevertheless, developing its energy infrastructure based on wind, biomass and solar photovoltaic is still a challenging task. The reason for this is that Ukraine maintains a preference in its energy policy for dependence on fossil fuels, thus cementing future “path dependencies” when policy decisions of the past will determine future circumstances in the energy transition process (Orel 2016). The most recent example of Ukraine contradicting its obligations to IRENA is the emergence of new patterns of fossil fuel dependence in US–Ukrainian energy cooperation under the Donald Trump administration. On 10–12 November 2018, US Secretary of Energy Rick Perry visited Ukraine and together with Ukrainian President Petro Poroshenko launched one of the so-called US–Ukraine security dialogue series – but this time it would significantly benefit US fossil fuels industries.<sup>4</sup>

The US is “touting its LNG as more reliable than pipelined gas from Russia, but LNG is more expensive because of the costs of shipping and super-cooling the fuel to the point where it becomes a liquid” (Reuters, 1 November 2018). The LNG option is expensive, as Ukraine would need to build a LNG-receiving terminal – but this costly choice might still help the country to diversify its natural gas needs. However, it is important to highlight that, besides the US and Ukraine, Turkey also needs to support this project since LNG will pass through Istanbul. Moreover, the US coal industry that is supported by the Trump administration has found a new market in Ukraine due to the military conflict in Donbas. An important reason for obliging Ukraine to buy US coal is that the latter's domestic consumption of the commodity “has dropped to the lowest level since 1983 due to closures of coal-fired power plants that are suffering from abundant, cheap supplies of natural gas” (Reuters, 1 November 2018). To help a declining US coal industry, Trypilska thermal power plant has already received the first supply of anthracite coal transported from Pennsylvania (Ministry of Energy and Coal Industry of Ukraine, 10 November 2018).

It can be concluded that there is very slow progress being made in innovative and creative shifts in Ukrainian electricity transition policy, as well as a lack of commitment to the transformation and modernisation of electricity systems that should be based on promoting new business models backed up by reformed political, regulatory and industrial infrastructures. There is a need to boost the renewable energy investments that could not only provide sustainable development but also ensure the country's energy security, independency and help create new jobs. In so doing, Ukraine first and foremost should seek to avoid simply transferring corruption, oligarch monopolisation and informal practices from the fossil fuels industry to the renewables sector (Aliyev 2016; Polese 2008).

In this sense, there is a chance that these nefarious practices can spread to the renewables sector going forwards. As Ukrainian Prime Minister Vladimir Grossman noted, "the main task is to make Ukraine an absolutely energetically independent country that produces gas and develops alternative energy" (Wageningen University Report, 19 September 2018, 22). However, to achieve this Ukraine needs to simultaneously increase political will, decrease the import of traditional energy fuels, eradicate corruption, overcome oligarchs' monopoly and increase the domestic production of renewables. The reality on the ground shows that this is not even close to being the case at present, as according to Bloomberg one of the country's richest oligarchs is now slowly establishing his dominance over the renewables sector there (Sazanov 2018).

## Conclusion

In this paper we have argued that, despite remarkable natural gas and electricity reforms having indeed been undertaken, Ukraine still has significant work to do in order to secure its energy future. The timely implementation of reform is needed in both the gas and electricity sectors. Ukraine has accepted at least new legislation requirements in both of these sectors, as part of its aim to stimulate and simplify the country's energy transition. However, these laws have not always been properly implemented due to strong corruption in the energy sector, oligarchic power and a general lack of political will. In this regard, proper implementation is necessary to achieve results in the short, medium and long term; otherwise, they will lead only to further failed reform.

On its own, the EU's influence has been ineffective in overcoming domestic barriers to reform; it was Russia's aggression that finally pushed Ukraine to follow and implement EU rules, in fact. Current energy reforms are a good example of this. The implementation of gas market ones in Ukraine indicates that the process is not easy, linear or direct, and delays or forces outside of the industry may shape the configurations of the business environment. As such, gas market reform is occurring within a very problematic and complex institutional context and is motivated by the need to improve deteriorating national

finances rather than achieving optimal operational efficiency. The EU needs to recognise this situation, depart from its supply-driven approach and avoid exporting regulatory templates developed within the EU itself.

Simultaneously, Ukraine needs to make sure that the new energy laws are systematically implemented by all government institutions and no room exists for oligarchs to undermine these new laws and/or sideline them. More concretely, the Ukrainian government should eliminate the established interests of oligarchs, and make sure that they are not highly selective about the adoption of new reforms and rules. Therefore, the government itself first needs to fully embrace such reforms; right now it seems that there is still no genuine political will yet and change is mostly only enforced by international actors like the IMF, World Bank and the EU. Second, after embracing reform, it will be necessary to establish an independent judiciary and overhaul its Soviet mindset and corrupt system. Otherwise, this will be another missed opportunity for Ukraine – which was the case in 1991–92 and 2004 too (Kuzio 2007). Although reforms in the natural gas sector assist Ukraine in decreasing Russian energy leveraging, in the long term they do not enhance its energy security and diversity. In other words, by depending on reverse gas flows Ukraine is becoming more dependent on Western energy companies rather than diversifying its supplies per se. The main question that Ukrainian government needs to consider, then, is whether the gas coming from the West really does represent diversification – or whether it simply constitutes the re-routing of Russian gas.

For electricity sector reform, it would be significantly more beneficial for Ukraine's energy security in the long term to prioritise the development of its domestic production – such as via RES. Avoiding the cementing of future path dependencies on the fossil fuels industries is key, and particularly on coal and gas – no matter whether the suppliers are Russian, European or from the United States. To make Ukraine energy independent, the country needs to reduce the import of traditional energy fuels and increase domestic fossil fuels and renewables production in tandem. Ukraine should also seek to avoid importing traditional corrupt practices in renewables – though, the reality on the ground shows that the opposite is currently happening. Finally, Ukrainian politicians should not determine energy price but the market should instead be responsible for it.

In terms of the limitations of this paper, we have focused particularly on the natural gas, electricity and renewables sectors, which has left other ones unexamined. More specifically, the oil, coal, nuclear and LNG sectors could not be discussed due to the limited space and scope of the paper. In this regard, further research is necessary to address developments and requirements in these energy sectors too.

## Notes

1. This a legislative package for the internal gas and electricity markets in the EU, with its purpose being to further open up these two markets.

2. The new energy strategy of Ukraine includes: reducing energy-import dependency, diversification of sources and routes of energy supply, security of production and deliveries of energy, energy efficiency, a competitive energy market and the modernisation of related institutions (for the full document, please see: Ukraine-Office EU 2018).
3. Since 2014, Gazprom and Naftogaz have been locked in a legal battle over contractual obligations concerning supply conditions and the terms of gas transit. The disputes are currently being considered by the arbitration tribunal in Stockholm. In May 2017, the tribunal issued a preliminary decision and reportedly rejected Gazprom's claim that Naftogaz had violated take-or-pay provisions in their sales purchase agreement. Under these provisions, Naftogaz would have been obligated to pay for excessive volumes of gas each year regardless of actual demand; Gazprom sought penalties amounting to USD 34.5 billion for gas supplies not delivered. In late December 2017, the tribunal appeared to confirm its May decision in further findings regarding the questioned gas price.
4. Since 2004 the US and Ukraine have launched eight security dialogue series. For more information see: [http://usukrainianrelations.org/index.php?option=com\\_content&task=view&id=17&Itemid=42](http://usukrainianrelations.org/index.php?option=com_content&task=view&id=17&Itemid=42)

## Disclosure statement

No potential conflict of interest was reported by the authors.

## References

- Abbott, P., and C. Wallace. 2009. "Patterns of Participation in the Formal and Informal Economies in the Commonwealth of Independent States." *International Journal of Sociology* 39 (2): 12-38. doi:10.2753/IJS0020-7659390201.
- Aliyev, H. 2016. "End to Informality? Examining The Impact of Institutional Reforms on Informal Institutions in Post- Euromaidan Ukraine." *Journal of Contemporary Central and Eastern Europe* 24 (3): 207-221. doi:10.1080/0965156X.2016.1260206.
- Antonenko, A., R. Nitsovysh, and O. Pavlenko. 2018. *Reforming Ukraine's Energy Sector: Critical Unfinished Business*, Feb 6. <http://carnegieeurope.eu/2018/02/06/reforming-ukraine-s-energy-sector-critical-unfinished-business-pub-75449>
- Aslund, A. 2005. "The Economic Policy of Ukraine after the Orange Revolution." *Eurasian Geography and Economics* 46 (5): 327-353. doi:10.2747/1538-7216.46.5.327.
- Aslund, A. 2016. "Are Ukraine's Reforms Breaking Its State Capture? an Agenda for Genuine Change." *Eurasian Geography and Economics* 57 (6): 819-833. doi:10.1080/15387216.2016.1250223.
- Balazs, J. 2018. *Ukraine's Reforms Await the Voters' Verdict*, Mar 27. Accessed 23 Nov 2018. <https://carnegieendowment.org/2018/03/27/ukraine-reform-monitor-march-2018-pub-75909>
- Bayramov, A. 2018. "Book Review: The New Geopolitics of Natural Gas." *Europe-Asia Studies* 70 (1): 140-141. doi:10.1080/09668136.2017.1414446.
- Bayramov, A., and D. Nolan. 2017. "Book Review: Security, Democracy and Development in the Southern Caucasus and the Black Sea Region." *European Security* 26 (4): 576-578. doi:10.1080/09662839.2017.1329723.

- BBC. 2016. *Hackers behind Ukraine Power Cuts, Says US Report*, Feb 26. Accessed 26 Nov 2018. <https://www.bbc.com/news/technology-35667989>
- British Petroleum. 2016. "BP Statistical Review of World Energy 2016" *Oilproduction*, Jun. Accessed 23 Nov 2018. <http://oilproduction.net/files/especial-BP/bp-statistical-review-of-world-energy-2016-full-report.pdf>
- Buckley, N. 2018. *Ukraine's Painful Reforms Start to Bear Fruit*, Sep 12. <https://www.ft.com/content/3bfd84d2-9405-11e8-95f8-8640db9060a7>
- Chow, E. 2016. *Ukraine – Still Far to Go in Fighting Energy Corruption*, Oct 18. Accessed 2 Jan 2019. <https://www.kyivpost.com/article/opinion/op-ed/edward-chow-ukraine-still-far-go-fighting-energy-corruption.html>
- Chumak, D., and A. Prokip. 2018. "Regional Stability through Energy Cooperation: The Case of the EU and Ukraine." *European View* 17 (1): 74–81. doi:10.1177/1781685818766449.
- D'Anieri, P. 2007. *Understanding Ukrainian Politics*. New York: Routledge.
- Dumych, T., S. Zheka, and O. Kravtsova. 2018. *Energy Ukraine 2019*. <https://www.globallegalinsights.com/practice-areas/energy-laws-and-regulations/ukraine>
- Ekologiya Pidprijemstva. 2018. *Україна стала членом авторитетного міжнародного агентства IRENA: про перспективи для українських «зелених» проектів*, Mar 06. Accessed 22 Nov 2018. <http://ecolog-ua.com/articles/ukrayina-stala-chlenom-avtorytetnogo-mizhnarodnogo-agentstva-irena-pro-perspektyvy-dlya>
- Energy Community. 2017. "Gas Sector Reform Implementation Plan: 2 Years After" *Energy Community Ukraine*, Accessed 26 Nov 2018. [https://www.energy-community.org/dam/jcr:a08c1edb-0821-41da-8f92-7bbfda8a074d/EnC\\_G\\_Implementation\\_Plan.pdf](https://www.energy-community.org/dam/jcr:a08c1edb-0821-41da-8f92-7bbfda8a074d/EnC_G_Implementation_Plan.pdf)
- Energy Information Administration. 2017. "International Analysis: Ukraine." *Energy Information Administration*, Jan. Accessed 23 Nov 2018. <https://www.eia.gov/beta/international/analysis.php?iso=UKR>
- Engie. 2018. *ENGIE shores up its presence in Ukraine and signs an agreement on gas transmission and storage*, Oct 28. Accessed 2 Feb 2019. <https://www.engie.com/en/journalists/press-releases/ukraine-agreement-on-gas-transmission-and-storage/>
- European Commission. 2016. *Association Implementation Report on Ukraine*. Brussels: European Commission. [https://eeas.europa.eu/sites/eeas/files/ukraine\\_v2\\_0.pdf](https://eeas.europa.eu/sites/eeas/files/ukraine_v2_0.pdf)
- European Commission. 2018. *Progress Reports*. Nov Accessed 26 Nov 2018. <https://ec.europa.eu/energy/en/topics/renewable-energy/progress-reports>
- European Parliament. 2017. *Ukraine's On-Going Reform Process: Progress and Challenges since Euromaidan*, Jul. Accessed 21 Jan 2018. [http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS\\_BRI\(2017\)608632](http://www.europarl.europa.eu/thinktank/en/document.html?reference=EPRS_BRI(2017)608632)
- Eurostat. 2017. *European Neighbourhood Policy - East - Energy Statistics*. December, Accessed 2 Feb 2019. [https://ec.europa.eu/eurostat/statistics-explained/index.php/European\\_Neighbourhood\\_Policy\\_-\\_East\\_-\\_energy\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php/European_Neighbourhood_Policy_-_East_-_energy_statistics)
- Eurostat. 2018. *Change in Gas Prices for Household Consumers Compared with Previous Year, Same Semester Second Half 2017*. Nov Accessed 23 Nov 2018. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Change\\_in\\_gas\\_prices\\_for\\_household\\_consumers\\_compared\\_with\\_previous\\_year\\_same\\_semester\\_Second\\_half\\_2017.png](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Change_in_gas_prices_for_household_consumers_compared_with_previous_year_same_semester_Second_half_2017.png)
- Financial Times. 2017. *Naftogaz Resignations Spark Concern over Ukraine Reforms*. Sep 21. Accessed 2 Feb 2019. <https://www.ft.com/content/877126b2-9ea1-11e7-8cd4-932067fbf946>
- Goncharuka, A., and C. Stortob. 2016. "Challenges and Policy Implications of Gas Reform in Italy and Ukraine: Evidence from a Benchmarking Analysis." *Energy Policy* 101: 456–466. doi:10.1016/j.enpol.2016.10.037.
- Grigas, A. 2017. *The New Geopolitics of Natural Gas*. New York: Harvard University Press.



- Grødeland, Å B. 2010. "Elite Perceptions of Anti-corruption Efforts in Ukraine." *Global Crime* 11 (2): 237-260. doi:10.1080/17440571003669241.
- Haring, M. 2017. *Maybe We Were Wrong about Gas Reform*, Dec 18. Accessed 2 Feb 2019. <https://www.atlanticcouncil.org/blogs/ukrainealert/maybe-we-were-wrong-about-gas-reform>
- Higgins, A. 2014. *Kiev Struggles to Break Russia's Grip on Gas Flow*, May 4. Accessed 2 Feb 2019. <https://www.nytimes.com/2014/05/05/world/europe/gazprom-seen-stanching-flow-of-gas-to-ukraine.html>
- IMF. 2017. *IMF Staff Country Reports: Ukraine: Selected Issues*, Apr 4. Accessed 22 Dec 2018. <https://www.imf.org/en/Publications/CR/Issues/2017/04/04/Ukraine-Selected-Issues-44799>
- IRENA. 2014. *IRENA Remap 2030*, Jun. Accessed 20 Nov 2018. <https://www.irena.org/publications/2014/Jun/REmap-2030-Full-Report>
- Klimina, A. 2015. "The Role of Economic Class in Understanding Social Provisioning Processes in the Post-soviet Transition: The case of Ukraine." *Journal of Economic Issues* 49 (2): 415-423. doi:10.1080/00213624.2015.1042749.
- Kuzio, T. 2007. "Kravchuk to Kuchma: The Ukrainian Presidential Elections of 1994." *Journal of Communist Studies and Transition Politics* 117-144. doi:10.1080/13523279608415306.
- Kuzio, T. 2012. "Ukraine's Relations with the West since the Orange Revolution." *European Security* 21 (3): 395-413. doi:10.1080/09662839.2012.655272.
- Legislation of Ukraine. 2015. *Про ринок природного газу*, Oct 1. Accessed 2 Feb 2019. <https://zakon.rada.gov.ua/laws/show/329-19/stru>
- Legislation of Ukraine. 2017. *Про енергетичну ефективність будівель*, 22 Jun. Accessed 2 Feb 2019. <https://zakon0.rada.gov.ua/laws/show/2118-19?lang=en>
- Logatskiy, V. 2018. *A Brief Description of the New Energy Strategy of Ukraine till 2035: Security, Energy Efficiency, Competitive Ability*, Accessed 20 Jan 2018. <https://ukraine-office.eu/en/a-brief-description-of-the-new-energy-strategy-of-ukraine-till-2035-security-energy-efficiency-competitive-ability/>
- Magen, A. 2007. "Transformative Engagement Through Law: The Acquis Communautaire as an Instrument of Eu External Influence." *European Journal of Law Reform* 9 (3): 361-392.
- Malygina, K. 2010. "Ukraine as a Neo-patrimonial State: Understanding Political Change in Ukraine in 2005-2010." *Journal of Labour and Social Affairs in Eastern Europe* 13 (1): 7-27.
- Ministry of Energy and Coal Industry of Ukraine. 2018. *Міністр енергетики США Пік Пеппі сьогодні прибув до України*, 10 Nov. Accessed 22 Nov 2018. [http://mpe.kmu.gov.ua/minugol/control/publish/article?art\\_id=245316666](http://mpe.kmu.gov.ua/minugol/control/publish/article?art_id=245316666)
- Naftogas Annual Report. 2017. *Historical Victory and the Beginning of Transformation*. Annual, Kiev: Naftogas. [http://www.naftogaz.com/www/3/nakweben.nsf/0/13CD2239A2033D96C22582CD003C9A4F?OpenDocument&year=2018&month=07&News&](http://www.naftogaz.com/www/3/nakweben.nsf/0/13CD2239A2033D96C22582CD003C9A4F?OpenDocument&year=2018&month=07&News&582CD003C9A4F?OpenDocument&year=2018&month=07&News&)
- Naftogaz. 2014. *НАФТОГАЗ УКРАЇНИ РІЧНИЙ ЗВІТ*, Accessed 2 Feb 2019. <http://www.naftogaz.com/files/Zvity/Naftogaz%20Annual%20Report%202014.pdf>
- Naftogaz. 2019. *Gas Consumption in Ukraine, 2017-2018*, Jan 1. Accessed 2 Feb 2019. <https://naftogaz-europe.com/article/en/gasconsumptioninukraine20172018>
- Nord-Stream. 2019. *A Record Volume of 58.8 Billion Cubic Metres of Natural Gas Has Been Transported through the Nord Stream Pipeline in 2018*, Jan 19. Accessed 2 Feb 2019. <https://www.nord-stream.com/press-info/press-releases/a-record-volume-of-588-billion-cubic-metres-of-natural-gas-has-been-transported-through-the-nord-stream-pipeline-in-2018-504/>
- OECD Report. 2018. *Anti-Corruption Reforms in Ukraine Prevention and Prosecution of Corruption in State-Owned Enterprises*. Accessed 2 Feb 2019. <http://www.oecd.org/corruption/acn/OECD-ACN-Ukraine-4th-Round-Bis-Report-SOE-Sector-2018-ENG.pdf>



- Orel, I. 2016. *Green Energy in Ukraine: The Die Is Cast*, Dec 27. Accessed 27 Nov 2018. <https://ecology.unian.net/alternativeenergy/1699967-zelenaya-energetika-v-ukraine-zhrebii-broshe.html>
- Oxenstierna, S., and J. Hedenskog. 2017. *Ukraine's Economic Reforms Prospects of Sustainability*. Analyses, The Swedish Defence Research Agency.
- Padgett, S. 2011. "Energy Co-Operation in the Wider Europe: Institutionalizing Interdependence." *Journal of Common Market Studies* 49 (5): 1065–1087. doi:10.1111/j.1468-5965.2010.02168.x.
- Pirani, S. 2017. "Adversity and Reform: Ukrainian Gas Market Prospects." *Oxford Energy Studies* 7: 1–12.
- Pirani, S. 2018. "Russian Gas Transit through Ukraine after 2019: The Options." *Oxford Institute for Energy Studies* 41: 1–21.
- Pleines, H. 2009. "The Political Role of the Oligarchs." In *Ukraine on Its Way to Europe*, edited by J. Besters-Dilger, 103–119. Frankfurt: Peter Lang Verlag.
- Polese, A. 2008. "If I Receive it, It is a Gift; if I Demand it, Then it is a Bribe': on the Local Meaning of Economic Transactions in Post-soviet Ukraine." *Anthropology in Action* 15 (3): 47–60. doi:10.3167/aia.2008.150305.
- Prange-Gstöhl, H. 2009. "Enlarging the EU's Internal Energy Market: Why Would Third Countries Accept EU Rule Export?" *Energy Policy* 37: 5296–5304. doi:10.1016/j.enpol.2009.07.070.
- Puglisi, R. 2003. "The Rise of the Ukrainian Oligarchs." *Democratization* 10 (3): 99–123. doi:10.1080/13510340312331293947.
- Radchenko, V., V. Kolvakh, and A. Doloudenko. Ukraine Next Steps on Electricity Market Transformation. 12 Apr 2018. Accessed 2 Feb, 2019. <https://www.cms-lawnow.com/eal/ters/2018/04/ukraine-next-steps-on-electricity-market-transformation>.
- Radchenko, V. 2015. Ukraine Government Adopts Robust Gas Market Reform Implementation Plan. 25 Mar 2015. Accessed 2 Feb 2019. <https://www.lexology.com/library/detail.aspx?g=467495dd-7254-488d-8a2c-1e108658f721>
- Radio Free Europe. 2009. *EU Feels Impact Of Russia-Ukraine Gas Dispute*, Jan 3. Accessed 2 Feb 2019. [https://www.rferl.org/a/EU\\_Feels\\_Impact\\_Of\\_Russia\\_Ukraine\\_Gas\\_Dispute/1366022.html](https://www.rferl.org/a/EU_Feels_Impact_Of_Russia_Ukraine_Gas_Dispute/1366022.html)
- Radio Free Europe. 2014. *Slovakia Tests Reverse Gas Flow to Ukraine*, Aug 16. Accessed 28 Nov 2018. <https://www.rferl.org/a/ukraine-slovakia-reverse-flow/26534011.html>
- Reuters. 2019. *Ukraine Says Russian Gas Transit Falls 7 Pct in 2018*. Jan 2. Accessed 2 Feb 2019. <https://af.reuters.com/article/commoditiesNews/idAFL8N1Z22JE>
- Rozwalka, P., and H. Tordengren. 2016. "The Ukrainian Residential Gas Sector: a Market Untapped." *Oxford Institute for Energy Studies* 109: 1–49.
- Sazanov, A. 2018. Richest Man in Ukraine Climbs Back After Wealth Destroyed by War. 25 Sept. Accessed 2 Feb 2019. <https://www.bloomberg.com/news/articles/2018-09-25/richest-man-in-ukraine-climbs-back-after-wealth-destroyed-by-war>.
- Sendich, E. 2014. "Comparison of International Energy Intensities across the G7 and Other Parts of Europe, Including Ukraine." *Energy Information Administration*, Nov Accessed 23 Nov 2018. [https://www.eia.gov/workingpapers/pdf/international\\_energy\\_intensity.pdf](https://www.eia.gov/workingpapers/pdf/international_energy_intensity.pdf)
- Stulberg, A. 2018. "Triangular Diplomacy and Europe's Changing Gas Network: From "Trying-Angles"." In *Triangular Diplomacy among the United States, the European Union and the Russian Federation*, edited by V. Birchfield and A. Young, 189–217. New York: Palgrave.
- Ukraine-Office EU. 2018. *A Brief Description of the New Energy Strategy of Ukraine till 2035: Security, Energy Efficiency, Competitive Ability*, Nov Accessed 20 Nov 2018. <https://ukraine-office.eu/en/a-brief-description-of-the-new-energy-strategy-of-ukraine-till-2035-security-energy-efficiency-competitive-ability/>

- Unian. 2018. *Ukrainian Energy Industry: Thorny Road of Reform*, Jan 10. Accessed 2 Feb 2019. <https://economics.unian.info/2338645-ukrainian-energy-industry-thorny-road-of-reform.html>
- Verkhovna Rada of Ukraine. 2017. *Проект Закону про ринок електричної енергії України*, 21 Feb. Accessed 2 Feb 2019. [http://w1.c1.rada.gov.ua/pls/zweb2/webproc4\\_1?pf3511=58829](http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=58829)
- Verkhovna Rada of Ukraine. 2016. *Проект Закону про Національну комісію, що здійснює державне регулювання у сферах енергетики та комунальних послуг*, Feb 3. Accessed 2 Feb 2019. [http://w1.c1.rada.gov.ua/pls/zweb2/webproc4\\_1?pf3511=55378](http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=55378)
- Verkhovna Rada of Ukraine. 2018. *Проект Закону про внесення змін до деяких законодавчих актів України щодо спрощення деяких аспектів нафтогазової галузі*, Mar 1. Accessed 2 Feb 2019. [http://w1.c1.rada.gov.ua/pls/zweb2/webproc4\\_1?pf3511=61900](http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=61900)
- Wageningen University. 2018. *Trends and Developments in the Renewable Energy Sector in Ukraine*, Sep 18. Accessed 20 Nov 2018. <https://www.agroberichtenbuitenland.nl/binaries/agroberichtenbuitenland/documenten/publicaties/2018/09/21/trends-in-biomass/2018+trends+in+renewable+sector+eng.pdf>
- Wilson, A. 2013. *Ukraine: Political and Economic Lessons from Democratic Transitions*. New York: Council of Foreign Affairs.
- Wolczuk, K. 2004. "Integration without Europeanisation: Ukraine and Its Policy Towards the European Union." *SSRN Electronic Journal* 15: 1–32.
- Wolczuk, K. 2016. "Managing the Flows of Gas and Rules: Ukraine." *Eurasian Geography and Economics* 57 (1): 113–117. doi:10.1080/15387216.2016.1174072.
- World Bank. 2016. *"Ukraine – Unbundling Options for Gas Transmission and Storage."* Working Paper, World Bank.